

CLAIMS

What is claimed is:

- 1 1. A method for automatically partitioning a behavioral description of an
2 electronic system between hardware and software for optimizing the system,
3 comprising the steps of:
4 (a) receiving a behavioral description of the electronic system;
5 (b) determining an optimal functionality between hardware and software of the
6 electronic system; and
7 (c) partitioning implementation of the functionality between the hardware and
8 software based on the determined optimal functionality.
- 1 2. A method as recited in claim 1, wherein the step of partitioning
2 implementation of the functionality includes varying at least one parameter
3 of at least one of the hardware and software.
- 1 3. A method as recited in claim 1, wherein the hardware and software are
2 formed on a reconfigurable logic device.
- 1 4. A method as recited in claim 1, further comprising the step of outputting at
2 least one of a description of the required processors, a description of the
3 machine code to operate the processors, and an identification of the
4 necessary hardware.
- 1 5. A method as recited in claim 1, wherein the step of determining an optimal
2 functionality includes generating a plurality of different partitions of the
3 functionality, estimating a performance of the hardware and software for
4 each of the different partitions, and selecting one of the different partitions
5 based on the estimate.

- 1 6. A method as recited in claim 1, further comprising utilizing a genetic
2 algorithm for estimating the performance of the hardware and software for
3 each of the different partitions.
- 1 7. A computer program embodied on a computer readable medium for
2 automatically partitioning a behavioral description of an electronic system
3 between hardware and software for optimizing the system, comprising:
4 (a) a code segment that receives a behavioral description of the electronic
5 system;
6 (b) a code segment that determines an optimal functionality between hardware
7 and software of the electronic system; and
8 (c) a code segment that partitions implementation of the functionality between
9 the hardware and software based on the determined optimal functionality.
- 1 8. A computer program as recited in claim 7, wherein the code segment that
2 partitions implementation of the functionality includes a code segment that
3 varies at least one parameter of at least one of the hardware and software.
- 1 9. A computer program as recited in claim 7, wherein the hardware and
2 software are formed on a reconfigurable logic device.
- 1 10. A computer program as recited in claim 7, further comprising a code
2 segment that outputs at least one of a description of required processors, a
3 description of machine code to operate the processors, and an identification
4 of necessary hardware.
- 1 11. A computer program as recited in claim 7, wherein the code segment that
2 determines an optimal functionality includes a code segment that generates a
3 plurality of different partitions of the functionality, a code segment that
4 estimates a performance of the hardware and software for each of the

5 different partitions, and a code segment that selects one of the different
6 partitions based on the estimate.

1 12. A computer program as recited in claim 7, further comprising a code
2 segment that utilizes a genetic algorithm for estimating the performance of
3 the hardware and software for each of the different partitions.

1 13. A system for automatically partitioning a behavioral description of an
2 electronic system between hardware and software for optimizing the system,
3 comprising:

- 4 (a) logic that receives a behavioral description of the electronic system;
5 (b) logic that determines an optimal functionality between hardware and
6 software of the electronic system; and
7 (c) logic that partitions implementation of the functionality between the
8 hardware and software based on the determined optimal functionality.

1 14. A system as recited in claim 13, wherein the logic that partitions
2 implementation of the functionality includes logic that varies at least one
3 parameter of at least one of the hardware and software.

1 15. A system as recited in claim 13, wherein the hardware and software are
2 formed on a reconfigurable logic device.

1 16. A system as recited in claim 13, further comprising logic that outputs at least
2 one of a description of required processors, a description of machine code to
3 operate the processors, and an identification of necessary hardware.

1 17. A system as recited in claim 13, wherein the code segment that determines
2 an optimal functionality includes logic that generates a plurality of different
3 partitions of the functionality, logic that estimates a performance of the

4 hardware and software for each of the different partitions, and logic that
5 selects one of the different partitions based on the estimate.

1 18. A system as recited in claim 13, further comprising logic that utilizes a
2 genetic algorithm for estimating the performance of the hardware and
3 software for each of the different partitions.